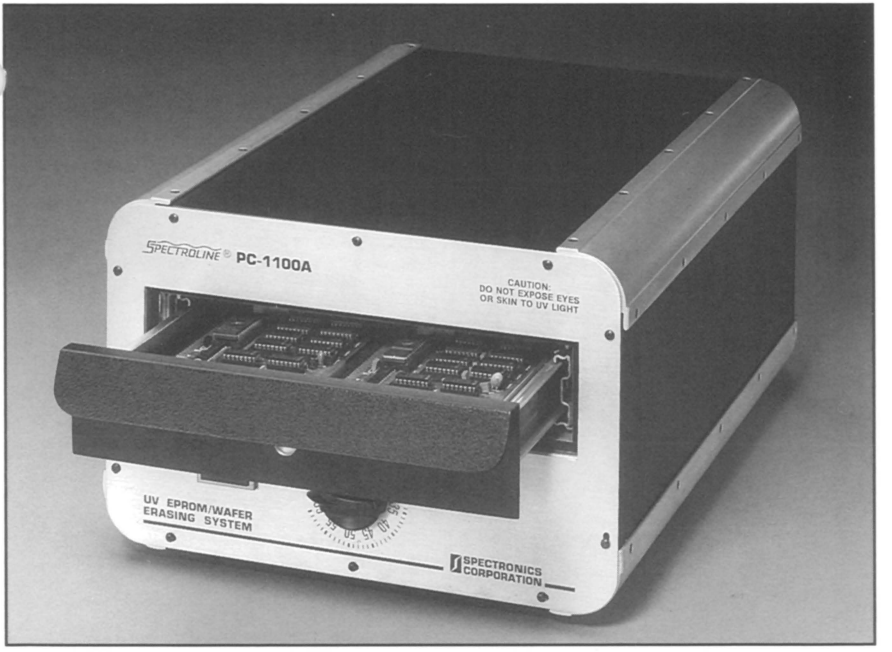
OPERATOR'S MANUAL

SPECTROLINE®

PC-1100A, -2200A, -3300A and -4400A UV EPROM Erasing Cabinets



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Congratulations on choosing a Spectroline® PC-Series UV EPROM Erasing Cabinet. Spectronics Corporation has designed and built this cabinet to provide the most desirable features, the best performance and, when used properly, years of trouble-free operation. Please read the instructions in this manual carefully *before* using the unit.

INTRODUCTION

The Spectroline PC-1100A, -2200A, -3300A and -4400A UV EPROM Erasing Cabinets are compact, heavy-duty units designed for high volume chip erasure. All four cabinets feature high intensity grid lamps which emit short wave UV (254nm) radiation. They are equipped with a presettable 60-minute timer for automatic unit shut-off, as well as high volume exhaust fans to maintain the temperature at chip level between 95°F (35°C) and 122°F (50°C).

A removable tray insert with a conductive foam pad for insertion of EPROM chips is provided with each cabinet. Additional tray inserts may be purchased for preloading of chips to reduce turn-around time.

- The PC-1100A comes complete with one 8 x 8" (20.3 x 20.3cm) grid assembly and an 8⅜W x 12L x 1⅜"H (21.3W x 30.5L x 3.5cmH) tray.
- The PC-2200A comes complete with two 8 x 8" (20.3 x 20.3cm) grid assemblies and a 16⅜W x 12L x 1⅜"H (41.6W x 30.5L x 3.5cmH) tray.
- The PC-3300A comes complete with three 8 x 8" (20.3 x 20.3cm) grid assemblies and a 24⅜W x 12L x 1⅜"H (61.9W x 30.5L x 3.5cmH) tray.
- The PC-4400A comes complete with four 8 x 8" (20.3 x 20.3cm) grid assemblies and a 32⅜W x 12L x 1⅜"H (82.2W x 30.5L x 3.5cmH) tray.

WARNING

This cabinet is carefully designed to prevent accidental ultraviolet exposure and electrical shock to the operator when properly used. However, no design can guard against intentional efforts to defeat the safety mechanisms or careless use of an instrument. Therefore, this manual must be read carefully and thoroughly understood before operating the cabinet. **Failure to follow directions could result in a serious or even fatal accident.**

UNPACKING AND INSPECTION

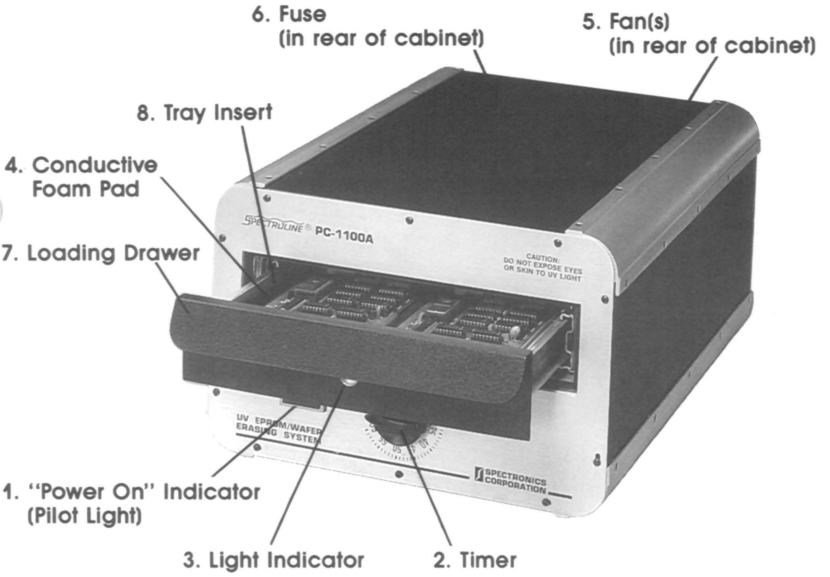
Unpack the cabinet and inspect it thoroughly for possible damage caused by shipment. Check the electrical performance as soon as possible according to the INSTALLATION notes and GENERAL FUNCTIONAL CHECKS outlined in the "OPERATION" section of this manual. If any damage is noted, immediately notify the carrier and supplier before attempting to use the instrument. Save the shipping cartons and packing materials for future storing and shipping of the cabinet.

The PC-Series cabinets are designed to operate from 115V/60Hz or 230V/50Hz. Versions that operate on 100V/50-60Hz are also available on special order. Refer to the plate on the back of the cabinet for power source requirements.

CABINET DESCRIPTION

1. "Power On" Indicator (Pilot Light)	Indicates that power is available to the grid lamp(s) and the fan. Timer should be set at a non-zero position. If drawer is not in fully closed position, lamp(s) will not be energized although fan(s) will be running.
2. Timer	Mechanical timer serves as an on-off switch as well as energizing lamp(s) for the predetermined time in minutes, up to 60 minutes. At all non-zero positions fan(s) will be running.
3. Light Indicators	Absorb UV to safely provide visible indication that the corresponding grid lamps are operating.
4. Conductive Foam Pad	Electrically conductive foam pad reduces the possibility of electrostatic damage to the EPROMs.
5. Fan(s)	High volume exhaust fan(s) produce optimum temperature conditions in the cabinet for maximum ultraviolet output and efficient erasing conditions.
6. Fuse	Buss ABC or MBO or equivalent of appropriate current.

7. Loading Drawer	Accepts EPROMs, PC boards, silicon wafers, metric cards and open-face stocking tubes for erasure.
8. Tray Insert	Easily removable for quick loading and unloading of devices. Height adjustable to maintain optimum exposure distance.



OPERATION

This section of the manual provides information required to operate the PC-Series cabinet in a safe and proper manner.

SAFETY PRECAUTIONS

This cabinet contains equipment producing hazardous voltages and also high levels of short wave ultraviolet (254nm) radiation. It should only be operated by personnel qualified to recognize electrical shock and ultraviolet radiation hazards and trained in the safety precautions required to avoid possible injury.

Remove all power before removing or replacing lamp assemblies.

Do not attempt to defeat the safety interlock in order to see whether the grid lamps are operating. If the lamps are functioning, a blue glow will be clearly visible at the light indicator(s) in the cabinet's drawer.

WARNING

The short wave ultraviolet radiation produced in this cabinet is hazardous. **Do not expose eyes or skin to this radiation.** Ultraviolet protective face wear (UVF-80 Face Shield) is available from Spectronics Corporation for use when limited exposure may be necessary. Fully cover hands, neck, and arms. Leave no part of the body exposed. Gloves and long sleeved shirt or lab coat are recommended.

INSTALLATION

This cabinet should be carefully unpacked and set upright on its rubber feet and operated only in this position. Place the cabinet at a safe distance from any surrounding walls to allow for proper air flow.

Connect the cordset to a power outlet that conforms to the power requirements of the cabinet as noted on the electrical characteristics nameplate on the back panel.

GENERAL FUNCTIONAL CHECKS

Close the drawer containing the removable tray insert. Set the timer to a non-zero position. The fan(s) should become energized and a blue glow should appear at all light indicators. Initially the light may flicker, but should become steady after a few seconds. This is normal, especially if the cabinet and grid lamp(s) are cold.

At the end of the preset exposure period, the grid lamp(s) and fan(s) will turn off automatically.

The cycle may be terminated prematurely by opening the drawer, at which point the grid lamp(s) should be de-energized, thus testing the safety interlock. The fan(s) will still be running provided the timer is at a non-zero value.

PROPER ADJUSTMENT OF TRAY INSERT

Every PC-Series cabinet is provided with a tray insert that is adjustable to varying heights. This allows the operator to maintain the optimum exposure distance. It is recommended that a $\frac{3}{8}$" (.95cm) distance be maintained between the grid lamps and the EPROMs.

The tray insert may be easily raised in the tray be turning the screws located at the four corners of the insert in a **clockwise** direction; it may be lowered by turning the screws in a **counter-clockwise** direction. Raising the tray insert (thus bringing the EPROM chips closer to the grid lamps) will increase the average ultraviolet intensity, although the irradiance distribution will become less uniform.

CALCULATING ERASE TIME

A good starting point can be obtained by dividing the EPROMs' nominal erasing energy in Watt-secs/cm^2 by 18,500 and multiplying by 1,000,000. This gives the estimated erasing time in seconds, based on the system's typical peak intensity of 18,500 μW/cm^2. If an ultraviolet intensity radiometer (such as the Spectroline Model DM-254X) is used, then a more accurate estimate may be obtained from:

$$\text{Time (seconds)} = \frac{\text{Nominal Erasing Energy (W-secs/cm}^2\text{)} \times 10^6}{\text{Irradiance } (\mu\text{W/cm}^2)}$$

For simplified calculation of erase time, the Spectroline Model DS-254E EPROMETER™ may be used. The DS-254E not only measures the UV irradiance of EPROM erasers but also recommends the proper erasing time in minutes.

NOTE: If any short wave UV radiometer other than a Spectroline model is being used, care must be taken to ensure that it is measuring 254nm and only 254nm. Some competitive meters have sensitivity to visible light, long wave UV and/or infrared radiation and thus can give misleading and excessive intensity values leading to incomplete erasure of the EPROM chips.

PROPER OPERATING PROCEDURE

1. Load devices to be processed into tray insert.
2. Place tray insert into loading drawer.
3. Close drawer.
4. Set cycle time by turning timer knob to desired position. "Power On" indicator will now light.
5. Fans and grid lamps will shut off automatically when cycle is complete and indicator light will go off.
6. Unload erased devices.

MAINTENANCE

The PC-Series cabinets are constructed with high quality materials and components. By providing reasonable care and following the instructions in this manual, the user can expect a long life from the cabinet.

The following servicing instructions are intended for limited maintenance of the PC-Series UV EPROM Erasing Cabinets. **Do not perform any servicing other than that contained in these instructions.** Return the cabinet to the factory for maintenance not covered in this section.

CONDUCTIVE FOAM PAD REPLACEMENT

Visibly worn conductive foam pads should be replaced to protect your EPROMs from harmful electrostatic buildup. To replace these pads, gently pull up the old pad and its adhesive backing. Peel off the protective paper covering the new pad's adhesive. Attach the pad to the loading tray in the same position as the former pad.

CLEANING THE GRID LAMPS

The output of UV grid lamps may be impaired by improper handling or cleaning. It is therefore recommended that the grids be cleaned periodically with a pure solvent (e.g. methanol) or mild detergent to remove dirt. The grids should subsequently be handled only with a clean cloth or gloves. Failure to do so can in time lead to one's fingerprints being etched into the grid, reducing the output.

WARNING

To reduce the risk of electric shock, do not attempt to clean the cabinet or grid lamps with the cabinet plugged into a power source. Immediately clean all spilled materials from the cabinet and wipe dry. If necessary, moisten a cloth with soap and water and clean the cabinet.

CHECKING GRID INTENSITY

Grid intensity should be measured periodically with a short wave UV radiometer, such as the Spectroline DM-254X or DS-254E. The ultraviolet grid lamps used in the PC-Series cabinets are designed to have a long life under normal operating conditions. However, as with any discharge-type lamp, the output slowly decreases at

a rate dependent upon the lamp's operating parameters, such as lamp current and voltage, cabinet temperature, number of on-off cycles, lamp operation time, presence or absence of vibration, and other factors. Generally, the end of life will correspond to a minimum usable output and not total failure.

Even though the grid lamp may appear to be operating satisfactorily because its corresponding light indicator maintains the blue visible glow, the effective 254nm output may be low. This low output will result in un-erased memory elements at acceptable erasing times. When the required erasing time becomes unacceptably long, it is time to replace the grid assembly.

NOTE: A flickering grid lamp or a lamp that fails to light can cause premature failure of the transformer. **It is strongly recommended that any PC-Series cabinet with a continually flickering or extinguished grid lamp be immediately withdrawn from service until the problem is diagnosed and corrected.**

CHECKING TRANSFORMER OUTPUT

WARNING — HIGH VOLTAGE

Refer this test to qualified personnel.

Due to the dangerous nature of high voltage testing procedures, we recommend a simple comparison test for checking transformer output. A transformer suspected of substandard output may be tested by wiring it to a grid lamp of known intensity output. If the grid does not continue to produce similar UV intensity, then the transformer should be replaced.

TROUBLESHOOTING

If, at any time, the cabinet does not yield satisfactory results, follow the below procedure before attempting any other step:

a. Repeat the previously outlined inspection, installation and general functional checks.

b. Check that the drawer is properly closed and that the safety interlock mechanism has been activated.

c. Check that the timer is at a non-zero position.

If these steps do not yield satisfactory results, refer to the following TROUBLESHOOTING CHART.

Symptom	Probable Cause	Cure
1. Abnormally long erasure time	a. Grid lamp(s) functioning at substandard intensity level	a. Replace grid lamp(s)
	b. Transformer(s) functioning at substandard level.	b. Replace transformer(s)
	c. Tray insert height is too low	c. Raise height of tray insert
2. No erasure in area under one grid lamp	a. Grid lamp not functioning	a. Replace grid lamp
	b. Transformer failure	b. Replace transformer
3. Flickering light indicator	a. Grid lamp life expired	a. Replace grid lamp
	b. Transformer failure	b. Replace transformer

WARRANTY

The warranty policy for the PC-Series cabinets is provided on the Certificate of Limited Warranty enclosed separately with each unit.

NOTE: For assistance of any kind, contact the Customer Service Department at Spectronics Corporation. In the U.S. and Canada, call toll-free 1-800-274-8888. Give full details of the difficulty and include the model and serial numbers of the unit and date of purchase. If return of the cabinet to the factory is deemed necessary, shipping instructions will be provided. If an estimate of charges for non-warranty work or other service work is required, a quote will be furnished upon evaluation of the unit. Service work will not be performed without customer approval.

SHIPPING

Carefully pack the cabinet in the original shipping container and packing materials. Ship it prepaid to the factory and be sure to insure the cabinet for full value.

ORDERING INFORMATION

Description	Part No.
GRID ASSEMBLY for PC-Series	G750NO2
TRANSFORMER (115 Volts) for PC-Series	TPC-120
TRANSFORMER (230 Volts) for PC-Series	TPC-230
TIMER (115 Volts) for PC-Series	AT-120
TIMER (230 Volts) for PC-Series	AT-230
PILOT LIGHT (115 Volts) for PC-Series	PL-120
PILOT LIGHT (230 Volts) for PC-Series	PL-230
TRAY INSERT WITH CONDUCTIVE FOAM for PC-1100A	I-1100
TRAY INSERT WITH CONDUCTIVE FOAM for PC-2200A	I-2200
TRAY INSERT WITH CONDUCTIVE FOAM for PC-3300A	I-3300
TRAY INSERT WITH CONDUCTIVE FOAM for PC-4400A	I-4400
CONDUCTIVE FOAM PAD for PC-1100A	F-1100
CONDUCTIVE FOAM PAD for PC-2200A	F-2200
CONDUCTIVE FOAM PAD for PC-3300A	F-3300
CONDUCTIVE FOAM PAD for PC-4400A	F-4400

NOTE: When ordering a replacement part, be sure to specify voltage of cabinet.